National Asset Delivery

Technical Surveys and Testing

Works Information for M5 Blackbrook Interchange Crossovers – Trial Holes and Road Cores

CONTENTS AMENDMENT SHEET

Amend. No.	Revision No.	Amendments	Initials	Date
0	0	Original version issued with tender	ET	27/01/21

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1 DESCRIPTION OF THE WORKS

1.1 Project objectives

1.1.1 The principle objective of this project is:

Trial holes: in the soft central reserve to gather information about the ground conditions, carry out soil contamination testing and undertake

Cores: To undertake 2 no. Cores including PAK testing to determine the likelihood of the presence of tar materials at locations identified on drawings HE603426-KIER-VPS-M5_J25_MP_205.0-210.2_Z-DR-CB-00001.

Dynamic Cone Penetration (DCP) tests: undertake 13 No. as identified on drawing HE603426-KIER-VPS-M5_J25_MP_205.0-210.2_Z-DR-CB-00001.

This information will assist with the design of cross overs to be constructed to implement a contraflow during the bridge refurbishment works on the M5 north and southbound.

1.1.2 The specification that applies to the *works* is included in Section 6

1.2 Scope of works

1.2.1 The *works* to be provided under this contract are:

(1) The objectives of the trial hole surveys are to be achieved by hand excavating up to 1.0m deep:

- 5no trial holes in the central reserve where the proposed northern crossover is to be built
- 6no trial holes and 2no cores in the central reserve where the proposed southern crossover is to be built.

(2) For locations of trial pits and cores, refer to drawings HE603426-KIER-VPS-M5_J25_MP_205.0-210.2_Z-DR-CB-00001.

(3) Record soil description, thickness and depth of each type of material excavated (refer to Appendix 6 for specifications)

(4) Undertake 11no sampling for soil testing (POPs and standard Waste Suite - refer to Appendix 6 for specifications)

(5) Record buried services and drainage if exposed during hand excavation

(6) Undertake 2 no. cores including PAK testing to determine the likelihood of the presence of tar materials.

(7) Undertake 13no DCP tests, 1no test near each trial hole and within 2no. road core location

(8) The contractor is to ensure that on completion of all excavation works the trial holes are infilled and compacted properly up to existing verge level before the TM is removed. Excavated material should be set aside and reused for infill. As detailed in Section 6 – Specification.

Deliverables

1.2.2 The *Contractor* is required to produce the following deliverables:

(1) Site Plan – confirming the location of each trial hole with GPS coordinates.

(2) PDF copies of all testing reports (soil sampling)

(3) Trial pit and core logs.

(4) Core logs to include PAK testing result for each subsequent layer within each core.

(5) Where necessary a “+ve“ PAK test result to be followed up with PAH testing providing a waste classification of the material.

(6) Indicative drawings, complete with measurements showing the cross section of the trial hole with description of various layers of type of material (soil, stones, sub base, dry mix concrete, concrete etc.), exact position of exposed stats/drainage, edge of carriageway and VRS clearly marked.

(7) Feedback on potential clashes between STATS and renewal of VRS.

(8) Named Photographs with detailed description of location

(9) Confirm and record exact location of statutory undertakers apparatus.

(10) Excavation of trial holes to a maximum depth of up to 1.0m and record data as required in Cl 9.2.5 of PAS128.

(11) Soil testing and reporting in accordance with BS EN 1997 and environmental departments specifications.

(12) DCP test results

(13) The contractor is to provide detailed description and geometrical dimensions of the trial pits, location of buried services (if found) to a suitable hard reference point (barrier, parapet edge beam, carriageway etc.). as detailed in section 6 – specification.

2 EXISTING INFORMATION

2.1.1 Existing STATS

Motorway Communication cables located in the Southbound carriageway verge

Note, the successful survey contractor should consult with the Principal Contractor of the technology scheme during mobilisation to determine if any new services have been installed as part of the works but not noted on the STATS returns yet.

Low pressure Gas main traversing the M5 at approx. MP205/0+45m. Survey activity will not interact / affect the statutory undertaker's apparatus.

Overhead electricity cable traversing the M5 at approx. MP205/4+15m. cables present outside of survey area; however presence should be noted. Survey activity will not interact / affect the statutory undertaker's apparatus.

See drawing HE603426-KIER-VGN-M5_J25_MP_205.0-210.2_Z-DR-CB-0004 for more information on the existing STATS

Please note that the information shown on this drawing are extracted from C2 Stats returns and shall be considered as indicative only. No liability can be accepted for any inaccuracies in the information given. The Contractor shall satisfy themselves as to the exact position of the statutory undertakers or any other public or privately-owned services or supplies affected by the works. The Contractor shall obtain their own stats return prior to the start of the works.

2.1.2 Existing Drainage Arrangement:

Refer to Site Information for details

2.1.3 Existing Structures:

Refer to Site Information for details

2.1.4 Asbestos

The initial AAP for M5 J24 to J27 S/B & N/B was compiled in 2008 with an additional review being completed in 2013. See asbestos checklist for more information.

If any Asbestos Containing Materials that have not previously been identified are found, all works shall stop immediately, and the area is to be isolated from the workforce. The contractor must implement the necessary emergency response procedures in line with the company policy.

2.1.5 **The Drawings listed below apply to this contract**

Scheme Drawings

Drawing Number	Title
HE603426-KIER-VPS-M5_J25_MP_205.0-210.2_Z-DR-CB-00001	Trial Pit and Core Location Plan
HE603426-KIER-VGN-M5_J25_MP_205.0-210.2_Z-DR-CB-0004	Statutory Undertakers Plan

3 CONSTRAINTS ON HOW THE CONTRACTOR PROVIDES THE WORKS

3.1 General

3.1.1 The *Contractor* Provides the Works in such manner as to minimise the risk of damage or disturbance to or destruction of third party property.

3.1.2 The *Contractor* complies with the constraints and meets with the requirements outlined in Appendix 1.

3.1.3 The *Contractor* submits information detailing how the *Contractor* will provide the Works to the *Employer* prior to the *works* commencing. This information will include any lifting plans, risk assessments, method statements, the *Contractor's* staff training information and any other relevant Health and Safety requirements.

3.2 Working hours & site specific constraints

3.2.1 The *Contractor's* working hours for site works are anticipated to be 21:00-05:00, working under a series of lane closures with a temporary speed limit of 50mph. The anticipated working hours are dependent on the carriageway traffic counts.

3.2.2 **Work Constraints**

Health and Safety requirements

3.2.3 In Providing the Works the *Contractor* meets the requirements of Annex 2 of the supplementary constraints in relation to health and safety duties.

3.2.4 When implemented, the *Contractor* shall comply with the requirements of Highways England's safety passport scheme and ensure that all of his employees, and any of his subcontractor's, are registered in accordance with the implementation of the scheme.

3.2.5 For details of the CDM duty holders, refer to the pre-construction information which is included as part of the TST package.

3.2.6 Before commencing the construction phase of the *works*, the *Contractor* confirms to the *Employer* that adequate welfare facilities are in place. Where the facilities detailed in section 5 are not deemed adequate, the *Contractor* provides all necessary facilities to Provide the Works and to comply with the minimum requirements set out in HSE guidance document L153.

Environmental requirements

3.2.7 In Providing the Works the *Contractor* meets the requirements of Annex 2 of the supplementary constraints in relation to environmental duties.

Risk Management

3.2.8 The *Contractor* identifies, manages and mitigates risks in accordance with the principles of ISO31000.

3.2.9 The *Contractor* submits a risk register, which captures all risks associated with the delivery of the *works* including those identified by the *Employer*, with his tender and maintains it for the contract period.

The contractor should refer to the Pre-construction information and Design Hazard Checklist and Risk Reduction Schedule provided as part of the TST package.

4 REQUIREMENTS FOR THE PROGRAMME

4.1.1 The *Contractor* submits programme to the *Employer* with his tender.

4.1.2 The *Contractor* Provides the Works taking into account the following programme constraints:

(i) the *starting date* and *completion date* and any post site works, reporting and review period

(ii) The services and other things provided by *Employer* (see Section 5)

4.1.3 The programme should be in the form of an activity and time related bar chart, produced as a result of a critical path analysis.

4.1.4 The programme should preferably be provided in either a PDF or MS Excel format and cover the full contract period including post site activities. Activities should be clearly defined and named and the programme should detail the following:

- Planned date for works to start on site
- Start of consultation with Wales and West Utilities
- Duration of works
- Adjacent site activities
- When information will be provided back to the *Employer*

(i) dates and times associated with the project, including the *starting date*, *completion date* & *Contractor's* planned completion, and any other dates or times that will specifically impact the delivery of the project

(ii) activities associated with delivering the project

4.1.5 The *Contractor* updates the programme every week. The *Contractor* submits an updated programme to the *Employer* upon request.

5 SERVICES AND OTHER THINGS PROVIDED BY THE *EMPLOYER*

5.1.1 The following temporary traffic management will be provided by the *Employer* to allow the *Contractor* to Provide the Works:

(1) A series of lane closures with a temporary speed limit of 50mph If works are being completed in the Hard shoulder/Lane 1 then Lane 2 should also be closed with Lane 3 open to traffic. If works are being completed in Lane 3 and the Central Reservation then Lane 2 should also be closed with traffic running in lane 1. A lane 3 closure should also be provided on the opposite carriageway when works are being completed in the Centre reservation.

(2) Traffic management requirements will be finalised during mobilisation with the successful contractor.

5.1.2 The other things that will be provided by the *Employer* are as follows:

(1) Welfare facilities will be provided by the principle contractor.

6 SPECIFICATION FOR THE WORKS

6.1.1 The *Contractor* shall undertake the works in accordance with:

(1) MCHW Volume 5, Section 3, Part 4, Chapter 6 'Contract Documents for specialist activities – Ground Investigation – Specification – Pits and Trenches.

(2) Interim Advice Notice 184/16 – Highways England CAD and Data Standard, BS 1377 Part 3 Chemical Testing in Soils. Exploratory holes in accordance with BS 5930:2015 – Ground Investigations.

6.1.2 Trial Pits - The report should show the following information:

- The dates and location of where the trial pits were taken;
- Indicative drawings, complete with measurements showing the cross section of the trial hole with description of various layers of type of material (soil, stones, sub base, dry mix concrete, concrete etc.), exact position of exposed stats/drainage, edge of carriageway and VRS clearly marked.
- Stats information to include depth, diameter, type, colour, number, arrangement layout, offset form "hard reference".
- Comment on the weather conditions;
- Trial pit photographic records should include one or more faces and the spoil heap; all photographs should include a suitable and legible reference board. Artificial or flash lighting is normally required and photographs to be time stamped as well;
- Trial pits are to be hand dug to avoid striking statutory services.
- *Contractor* to produce a survey report to clarify the findings of the trial holes, including suitable cross section drawings/sketches to reference for the design and construction.
- Contractor to feedback any concerns for clashes between proposed drainage pipes/chambers and any STATS or existing highways furniture. (Refer to drawing HE603426-KIER-VGN-M5_J25_MP_205.0-210.2_Z-DR-CB-0004 for information regarding existing drainage system in the area).

6.1.3 Excavations shall be undertaken using the following methodology:

1. Prior to excavation clear vegetation;
2. Remove the top 100mm of topsoil
3. Carry out excavation to the specified depth. All subsoil must be kept in a separate pile from the topsoil.

6.1.4 Soil testing (POPs and Standard Waste Suite) – Applicable to both tests;

- Date test carried out and when soil samples were taken (including weather conditions)
- Location and depth of soil samples
- Hazardous Classification report
- List of contaminates tested for (See appendix 1)
- The levels of contaminates presents in soil and whether they exceed the allowable threshold
- If there is any material that looks unusual or does not match the colour of the rest of the trial pit a representative sample should be taken and labelled accordingly and a Trial Pit / Sampling Amendment Notification Form should be completed

Location of samples

For details of location of trial pit including NGR co-ordinates, refer to drawing HE603426-KIER-VPS- M5_J25_MP_205.0-210.2_Z-DR-CB-00001

Sample ID/Trial Pit	Lab testing	Location Grid Reference	Depth	No of containers
TP1 to TP11	**WM3**	**Central Reserve**	**100mm**	**2 x plastic tub, 1 x 250ml amber jar, 1 x 60ml amber jar**
TP1 to TP11	**WM3**	**Central Reserve**	**1000mm (max) or as deep as possible**	**2 x plastic tub, 1 x 250ml amber jar, 1 x 60ml amber jar**

6.1.5 Sample Containers

- Each container should be filled to the brim with no air pockets and the lid secure
- Containers should contain soil only, with no vegetation, dead leaves, gravel, rocks, litter or road kill.
- If the laboratory receives a sample with anything other than soil in it, the sample will be returned and a new sample should be provided.

6.1.6 Labelling Samples

- Client Name
- Project Name
- Sample Type (soil)
- Trial Pit Number
- Depth (XXX mm)
- Date sample was taken
- Time sample was taken

6.1.7 Trial pit reinstatement:

1. 100mm – 1500mm depth – On completion of works, backfill trial pits with subsoil in layers no greater than 150mm thick and well compacted.
2. 0 – 100mm (soft verge) – Replace previously removed topsoil and lightly compact.

6.1.8 Dynamic Cone Penetration (DCP) Tests

DCPs tests to be undertaken in accordance with TRL Dynamic Cone Penetration (D.C.P.) Tests Calculating equivalent CBR value using the Interim Advice Note (IAN) 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundation and referring to DMRB: HD29/08 (2008): Volume 7 Section 3 Chapter 7.

Location of tests to be carried out adjacent near trial holes as shown on drawing HE603426-KIER-VPS- M5_J25_MP_205.0-210.2_Z-DR-CB-00001.

Contractor shall be responsible to make sure that they do not affect and cause damage to existing drainage assets and/or buried services.

DCPs tests to be undertaken by UKAS accredited laboratory in material testing.

Test Report to include:

- Graph showing Accumulated number of blows along depth
- Graph showing CBR values along depth
- Thickness of layers with median CBR value for each layer

APPENDIX 1 - Sampling Suit – WM3

	Determinand	Limit of detection	Unit
	Chromatogram (TPH)		
	pH		
	ACM Type		
	Asbestos Identification	0.002	%
Heavy Metals	Antimony	2	mg/kg
	Molybdenum	2	mg/kg
	Barium	10	mg/kg
	Zinc	0.5	mg/kg
	Selenium	0.2	mg/kg
	Nickel	0.5	mg/kg
	Mercury	0.1	mg/kg
	Lead	0.5	mg/kg
	Copper	0.5	mg/kg
	Chromium	1	mg/kg
	Cadmium	0.1	mg/kg
	Arsenic	1	mg/kg
	Chromium (Trivalent)	5	mg/kg
	Chromium (Hexavalent)	0.5	mg/kg
Hydrocarbons	Fuel Type	N/A	mg/kg
	Aliphatic TPH >C5-C6	1	mg/kg
	Aliphatic TPH >C6-C8	1	mg/kg
	Aliphatic TPH >C8-C10	1	mg/kg
	Aliphatic TPH >C10-C12	1	mg/kg
	Aliphatic TPH >C12-C16	1	mg/kg
	Aliphatic TPH >C16-C21	1	mg/kg
	Aliphatic TPH >C21-C35	1	mg/kg
	Aliphatic TPH >C35-C44	1	mg/kg
	Total Aliphatic Hydrocarbons	5	mg/kg
	Aromatic TPH >C5-C7	1	mg/kg
	Aromatic TPH >C7-C8	1	mg/kg
	Aromatic TPH >C8-C10	1	mg/kg
	Aromatic TPH >C10-C12	1	mg/kg

	Aromatic TPH >C12-C16	1	mg/kg
	Aromatic TPH >C16-C21	1	mg/kg
	Aromatic TPH >C21-C35	1	mg/kg
	Aromatic TPH >C35-C44	1	mg/kg
	Total Aromatic Hydrocarbons	5	mg/kg
	Total Petroleum Hydrocarbons	10	mg/kg
PAH speciated	Naphthalene	0.1	mg/kg
	Acenaphthylene	0.1	mg/kg
	Acenaphthene	0.1	mg/kg
	Fluorene	0.1	mg/kg
	Phenanthrene	0.1	mg/kg
	Anthracene	0.1	mg/kg
	Fluoranthene	0.1	mg/kg
	Pyrene	0.1	mg/kg
	Benzo[a]anthracene	0.1	mg/kg
	Chrysene	0.1	mg/kg
	Benzo[b]fluoranthene	0.1	mg/kg
	Benzo[k]fluoranthene	0.1	mg/kg
	Benzo[a]pyrene	0.1	mg/kg
	Indeno(1,2,3-c,d)Pyrene	0.1	mg/kg
	Dibenz(a,h)Anthracene	0.1	mg/kg
	Benzo[g,h,i]perylene	0.1	mg/kg
	Total Of 16 PAH's	2	mg/kg
Phenols (BTEX)	Benzene	1	µg/kg
	Toluene	1	µg/kg
	Ethylbenzene	1	µg/kg
	m & p-Xylene	1	µg/kg
	o-Xylene	1	µg/kg
	Total Phenols	0.3	mg/kg